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NOTES ON GEOGRAPHIC DISTRIBUTION

Trogon rufus Gmelin, 1788, *Baryphthengus ruficapillus* (Vieillot, 1818), *Notharchus swainsoni* (Gray, 1846), *Synallaxis ruficapilla* Vieillot, 1819, *Tyrannopsis sulphurea* (Spix, 1825) and *Procnias nudicollis* (Vieillot, 1817) (Aves): Documented records in the state of Mato Grosso do Sul, Brazil

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ABSTRACT: A better understanding of patterns of species distribution is critical to carrying out the ecological studies needed to develop more appropriate conservation plans. Here we present records for six bird species in the state of Mato Grosso do Sul, Brazil. Five of these species (*Trogon rufus*, *Baryphthengus ruficapillus*, *Notharchus swainsoni*, *Synallaxis ruficapilla* and *Procnias nudicollis*) are rare and their distribution range is still poorly understood; one species (*Tyrannopsis sulphurea*) was recorded for the first time in the state.

The state of Mato Grosso do Sul is located in southwestern Brazil, covering 358,000 km^2. There are two main vegetation-climatic domains in the state, the Cerrado in the north and east and the Pantanal wetlands in the west (Ab'Saber 1977), but also the Atlantic Forest in the south and the Chaco in the southwest of the state. Although this variation in the landscape provides suitable conditions for high bird species richness, there is a knowledge gap in Mato Grosso do Sul concerning species occurrence and distribution (Pivatto *et al.* 2006). Some studies have been undertaken to determine the bird composition of specific localities outside the Pantanal wetland, such as in the east (Piratelli *et al.* 2001; Piratelli and Pereira 2002; Piratelli 2003; Piratelli and Blake 2006), west (Straube *et al.* 2006), north (Silva *et al.* 2006), south (Gimenes *et al.* 2007; Faxina and Schlemmermeyer 2010) and central regions of the state (Ilha and Mercante 2003a, b). Especially the southern region has been poorly studied in terms of its avifauna, and most of the available information is restricted to locations near the Paraná River (Straube and Urben-Filho 2002). Moreover, there is a lack of information regarding bird communities which live further inwards (Straube and Urben-Filho 2002).

Understanding the factors underlying species distribution is crucial for biodiversity conservation and management (Sutherland 2000) since habitat changes caused by man may affect the occurrence of species (Parmesan *et al.* 2005; Lomolino *et al.* 2006; Frey 2009). Species distribution plays an important role in the carrying out biogeography and ecology studies (Piacentini *et al.* 2006). Therefore, occurrence data of rare and endangered species are essential to improve the results of studies that target conservation (Silva *et al.* 2004).

In this study we present occurrence records for five rare and poorly documented birds, as well as the first record for another bird species in the state of Mato Grosso do Sul. The species were recorded visually and acoustically during field surveys conducted in 2010 and 2011 in different regions of Mato Grosso do Sul. The taxonomic nomenclature of species follow guidelines of the Brazilian Ornithological Records Committee (CBRO 2011). Vocalization and photographic records of bird species were uploaded to the WikiAves website (http://www.wikiaves.com.br) and provided with digital vouchers, which can be searched by the catalogue numbers listed in the text.

***Trogon rufus* Gmelin, 1788 (Trogonidae) - Black-throated Trogon:** On 11-12 August 2011, two individuals were sighted at the Campanário farm, located in the municipality of Amambai. Vocalizations were recorded (WA522118) by M.N.G. and the individuals were observed in a semideciduous forest fragment of approximately 30 km^2 (22°53'19.08" S, 55°3'8.37" W) near the Amambai River (Figure 1). The Black-throated Trogon is considered rare in Mato Grosso do Sul and may occur only in the southern region (Gwynne *et al.* 2010). Its distribution was confirmed by this record and two other records collected in the Ivinhema River sub-basin (Gimenes *et al.* 2007) and in the municipality of Laguna-Carapã (Della-Flora 2010).

***Baryphthengus ruficapillus* (Vieillot, 1818) (Momotidae) - Rufous-capped Motmot:** One individual was found dead by J.C.M.F. on 12 January 2011 in a gallery forest on the Tronqueira River (22°15'3.93" S, 55°12'0.93"

W), near the Bunge Sugarcane Mill in the municipality of Ponta Porã (Figure 1). In the same locality, J.C.M.F. recorded two individuals on 17-18 August 2011. On the first day, vocalizations of two individuals were recorded about 200 m from the edge of the gallery forest. Their vocalizations were recorded (WA520119) and then played back in order to attract the individuals. However, only one individual was sighted perching at a height of approximately 5 m and photographed (WA422989) for documentation purposes. This species was also tape recorded (WA522106) by M.N.G. on 11 August 2011 at the Campanário farm, located within the municipality of Amambai. On this occasion, four individuals were heard in a semideciduous forest fragment of approximately 30 km^2 (22°53'19.08" S, 55°3'8.37" W), connected to the Amambai River (Figure 1) by a riparian forests. In Mato Grosso do Sul, this species is rare and found only in the southeastern reaches of the state (Gwynne *et al.* 2010), with a few records in the Ivinhema River sub-basin (Straube *et al.* 1996; Gimenes *et al.* 2007) and the municipality of Fátima do Sul (Souza 2010a).

***Notharchus swainsoni* (Gray, 1846) (Bucconidae) - Buff-bellied Puffbird:** On 16 September 2010, near the Laguna Sugarcane Mill in the municipality of Batayporã, two individuals were sighted in a semideciduous forest fragment of about 2 km^2 (22°27'21.61" S, 53°17'21.57" W), near a gallery forest on the Ribeirão Esperança River (Figure 1). The birds were photographed (WA402801) by M.N.G. while feeding on arboreal termites. On 13 August 2011, we recorded the vocalizations of two individuals (WA522117) in a canopy created by riparian forest on the Amambai River (22°54'59.46" S, 54°54'59.89" W), in the municipality of Amambai. In February, June and September 2011, J.C.M.F observed individuals in a semideciduous forest fragment (21°49'19.71" S, 54°4'50.55" W) near the Eldorado Sugarcane Mill, in the municipality of Rio Brilhante (Figure 1). During the first event, the vocalization of an individual was recorded (WA520116) after using a pre-recorded playback to attract it. The individual was an adult which landed at a height of 20 m in a *Caesalpinia peltophoroides* Benth. In subsequent months, two individuals were observed and photographed in the canopy of the same tree. On 12 October 2011, J.C.M.F. photographed (WA469990) an individual in a semideciduous forest fragment (21°34'37.97" S, 54°13'57.32" W) near the Santa Luzia Sugarcane Mill, in the municipality of Nova Alvorada do Sul (Figure 1). Most bird fieldguides (*e.g.* Sigrist 2007; Mata *et al.* 2006; Gwynne *et al.* 2010), with the exception of van Perlo (2009), do not include the state of Mato Grosso do Sul in the geographic distribution of this species. However, Gimenes *et al.* (2007) recorded the species in the Ivinhema River sub-basin, and Souza (2010b) observed an individual in the municipality of Novo Horizonte do Sul. Present records expand the distribution of the species in Mato Grosso do Sul and confirm its occurrence in the inwards portion of the state (municipality of Nova Alvorada do Sul). This is the westernmost record for this species in the state, *c.* 115 km from the former record in the municipality of Novo Horizonte do Sul (Souza 2010b).

***Synallaxis ruficapilla* Vieillot, 1819 (Furnariidae) - Rufous-capped Spinetail:** On 10-11 February 2011, three individuals were recorded by J.C.M.F. in a semideciduous forest fragment (21°49'19.71" S, 54°4'50.55" W) near the Eldorado Sugarcane Mill, in the municipality of Rio Brilhante (Figure 1). The individuals were heard in the understory near the fragment's edge. At the same location, an individual was tape recorded (WA520124) on 16 June 2011, and two individuals were sighted on 17 June. Birds were observed foraging in the fragment and were photographed for documentation (WA372559). On 7 September 2011, vocalizations of two individuals on the edge of the same fragment were recorded. In Mato Grosso do Sul, the species occurs in the southeastern and southern regions of the state (Gwynne *et al.* 2010), as confirmed by Gimenes *et al.* (2007) in the Ivinhema River sub-basin. According to Pivatto *et al.* (2006), there have also been records of this species in the Serra da Bodoquena National Park, in the municipalities of Bodoquena and Bonito. However, the existence of this single record in the western region of the state should be treated with caution and needs confirmation, as well as proper documentation (Pivatto *et al.* 2006). The data presented here can be considered the first documented records of this species in the inwards portion of the state of Mato Grosso do Sul.

***Tyrannopsis sulphurea* (Spix, 1825) (Tyrannidae) - Sulphury Flycatcher:** Species recorded by J.C.M.F. on 16-18 December 2010 in a riparian forest on the Indaiá River (18°59'7.27" S, 52°21'20.01" W), in the municipality of Chapadão do Sul (Figure 2). On the first day, an individual was observed foraging at a height of approximately 4 m in a palm tree (*Mauritia flexuosa* L.). Since *T. sulphurea* is easily confused with species of the genus *Myiozetetes* (Pacheco *et al.* 2010), this record was only confirmed during the following days, when an individual responded to a playback of a pre-recorded vocalization. On 17 November 2011, the species was recorded by J.C.M.F. on a palm tree located in a riparian forest at the edge of the Correntes River (17°32'7.88" S, 54°26'47.06" W), near the Santa Gabriela Small Hydroelectric Power Plant, in the municipality of Sonora (Figure 2). An individual was heard and identification was confirmed after a vocalization playback. Once attracted, the individual roosted at a height of about 5 m in a palm tree where it was photographed (Figure 3) and its vocalization was recorded (WA499075). The distribution of the Sulphury Flycatcher is primarily restricted to the Amazon region (Sick 1997; Silva 1996; Ridgely and Tudor 2009). However, Pacheco *et al.* (2010) recently recorded the species in the Cerrado, in the states of Goiás and Minas Gerais. Our record represents the first register of Sulphury Flycatcher in the state of Mato Grosso do Sul and a new southern occurrence for the species in the country, expanding its distribution by *c.* 200 km from the former register in the municipality of Santa Vitória, in the state of Minas Gerais (Pacheco *et al.* 2010).

***Procnias nudicollis* (Vieillot, 1817) (Cotingidae) - Bare-throated Bellbird:** On 11-13 January 2011, two individuals were recorded by J.C.M.F. near the Bunge Sugarcane Mill, in the municipality of Ponta Porã. On the first day, individuals were heard in a semideciduous forest fragment (22°15'38.34" S, 55°6'29.59" W) surrounded by wetlands. During the following days, vocalizations were recorded (WA520138) in a stretch of gallery forest on the Tronqueira River (22°15'3.93" S, 55°12'0.93" W) (Figure 1). The species was also recorded by M.N.G. on 12 August

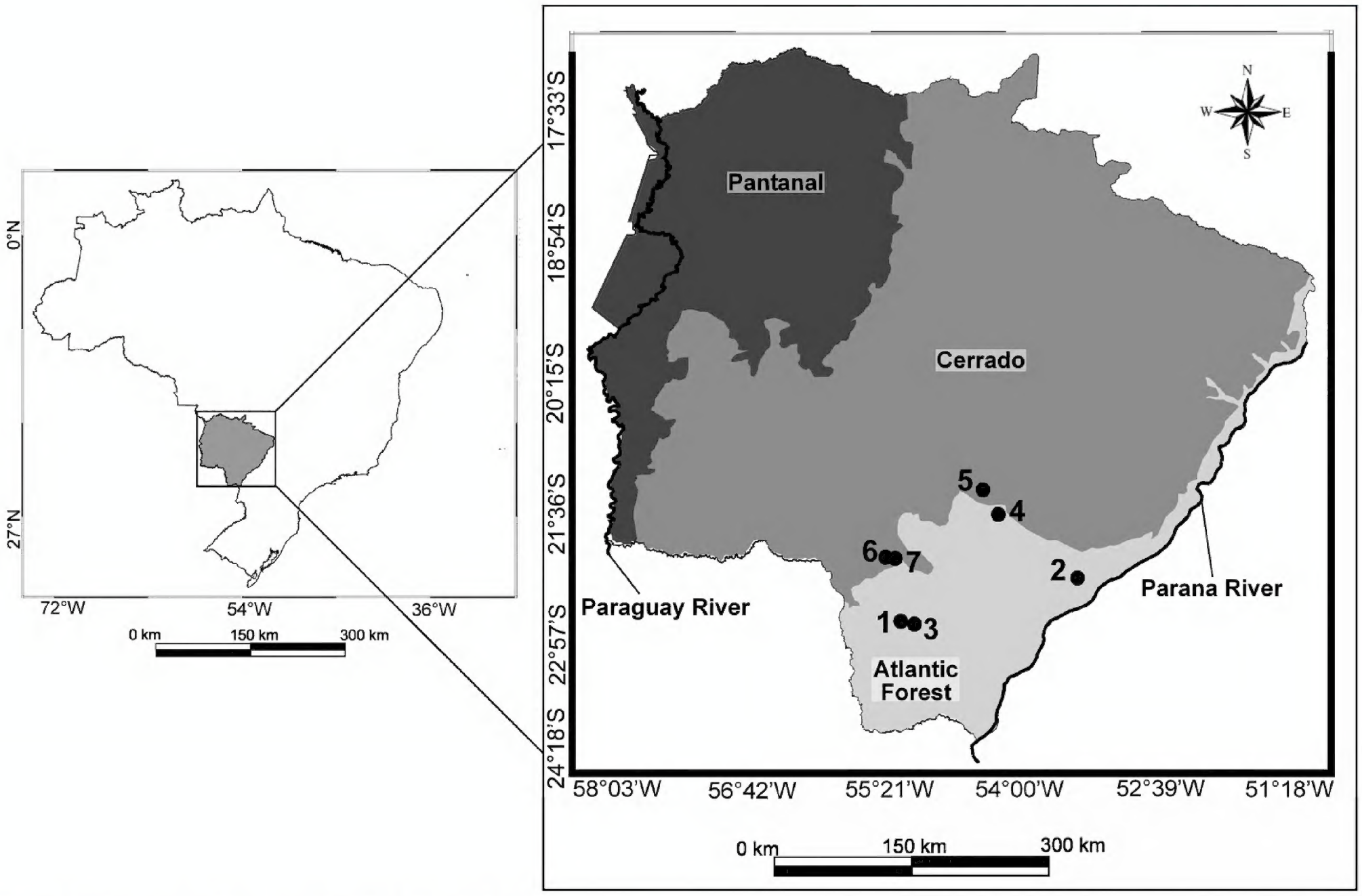

Figure 1. Occurrence of *Trogon rufus* (Point 1), *Notharchus swainsoni* (Points 2, 3, 4 and 5), *Baryphthengus ruficapillus* (Points 1 and 6), *Synallaxis ruficapilla* (Point 4) and *Procnias nudicollis* (Points 1, 6 and 7) in the state of Mato Grosso do Sul. 1: Campanário farm, Amambai municipality; 2: Laguna Sugarcane Mill, Batayporã municipality; 3: Gallery forest at Amambai River, Amambai municipality; 4: Eldorado Sugarcane Mill, Rio Brilhante municipality; 5: Santa Luzia Sugarcane Mill; Nova Alvorada do Sul municipality; 6: Bunge Sugarcane Mill, Ponta Porã municipality; 7: gallery forest on the Tronqueira River, Ponta Porã municipality.

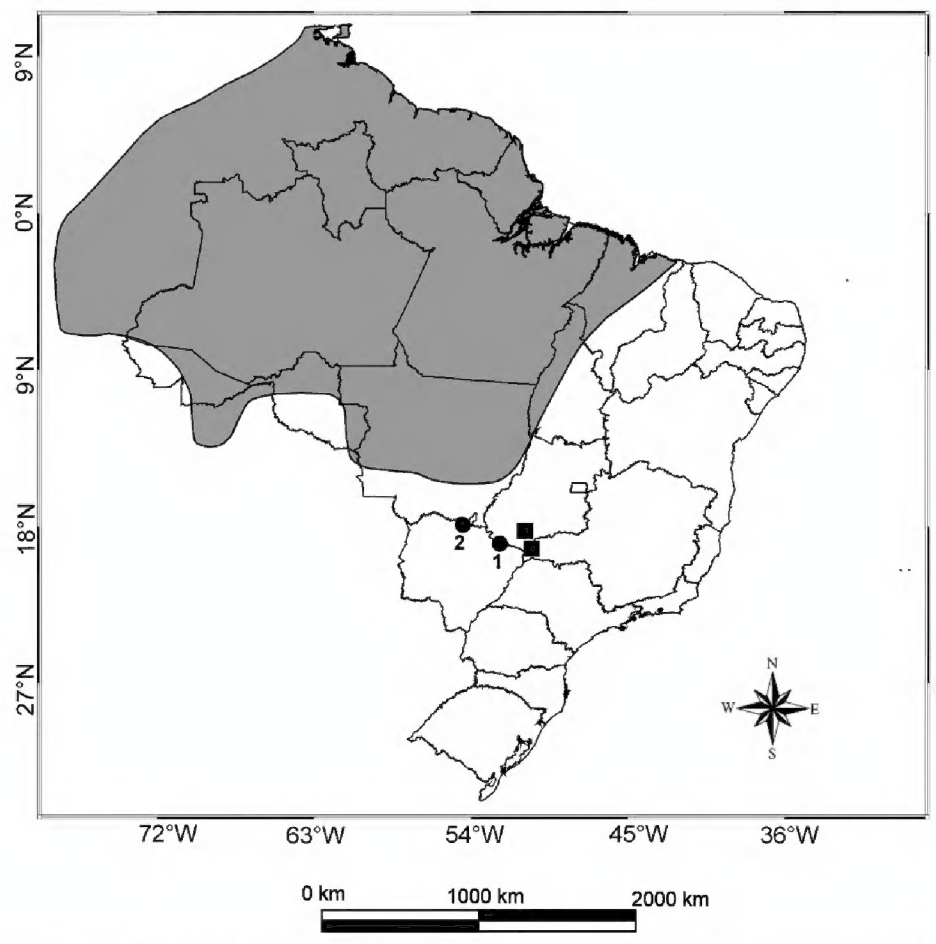

Figure 2. Distribution of the *Tyrannopsis sulphurea* (NatureServe 2007, shaded area), additional records by Pacheco et al. (2010) in the states of Goiás and Minas Gerais (squares), and the new records from the present study (Points 1 and 2). 1: Gallery forest on the Indaiá River, Chapadão do Sul municipality; 2: Gallery forest on the Correntes River, Santa Gabriela Small Hydropower Plant, Sonora municipality.

2011 at the Campanário farm, in the municipality of Amambai. Two individuals were heard and their calls were recorded (WA522114) in a fragment of semideciduous forest of approximately 30 km² (22°53'19.08" S, 55°3'8.37" W) and connected to the Amambai River through riparian forest (Figure 1). The Bare-throated Bellbird occurs in the east of the southernmost region of Mato Grosso do Sul (Sigrist 2007; Gwynne *et al.* 2010), where the species has been recorded in the Ivinhema River sub-basin (Gimenes *et al.* 2007) and in the municipality of Novo Horizonte do Sul (Della-Flora 2011). Our record in the municipality of Ponta Porã represents the westernmost limit of this species in Brazil, expanding its distributional range by *c.* 140 km from the previous record at Novo Horizonte do Sul (Della-Flora 2011). These records are important for the conservation of the species, since the Bare-throated Bellbird is considered rare and vulnerable to extinction (Gwynne *et al.* 2010; IUCN 2012). Possibly there are only small isolated populations of Bare-throated Bellbirds in the state, especially due to deforestation, forest fragmentation and trafficking of wild animals (Gwynne *et al.* 2010).

Our data complements knowledge of bird composition in the state of Mato Grosso do Sul, particularly due to limited information on bird communities in the south and southeastern regions (Straube and Urben-Filho 2002). These regions have suffered with natural habitat loss and fragmentation as a result of cattle ranching and soybean, corn and sugarcane monocultures (Gomes *et al.* 2007).

Finally, species reported in this study are rare and have restricted distribution in the state of Mato Grosso do Sul. All species are associated with forests and their conservation depends on the preservation of medium and large forest areas in the southern, southeastern and northern regions

of the state. There is very strong agricultural development in these regions, leading to increasing pressures on remaining forests. Thus, there is a need for further studies in order to fulfill gaps on distribution of these species in the state, as well as to indicate priority areas for conservation.

Figure 3. *Tyrannopsis sulphurea* photographed in the gallery forests of the Correntes River, State of Mato Grosso do Sul, Brazil. Photo: J.C. Morante-Filho.

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